DECISION
AND
FINDING OF NO SIGNIFICANT IMPACT
FOR THE ENVIRONMENTAL ASSESSMENT:

REDUCING DOUBLE-CRESTED CORMORANT DAMAGE THROUGH AN INTEGRATED WILDLIFE DAMAGE MANAGEMENT PROGRAM IN THE STATE OF MIGHIGAN

INTRODUCTION

Across the United States, wildlife habitat has been substantially changed as the human population expands and more land is used to meet human needs. These human uses often come into conflict with the needs of wildlife, which increases the potential for negative human/wildlife interactions. Double-crested Cormorants (*Phalacrocorax auritus*; DCCOs) are one of the wildlife species that engage in activities that conflict with human activities and resource uses. Conflicts with DCCOs include, but are not limited to foraging on fish at aquaculture facilities, foraging on populations of sport fish, negative impacts of local DCCO populations on vegetation and habitat used by other wildlife, damage to private property from DCCO feces, and risks of aircraft collisions with DCCOs. The United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS); the United States Department of the Interior (USDI), Fish and Wildlife Service (USFWS) and the USDI National Park Service (NPS), Sleeping Bear Dunes National Lakeshore prepared an Environmental Assessment (EA) evaluating ways by which the agencies may work together to resolve conflicts with DCCOs in Michigan. The EA replaces an analysis prepared in 2004 and amended in 2006. The analysis for the new EA was prepared in consultation with the Michigan Department of Natural Resources (MDNR), Chippewa-Ottawa Natural Resource Authority, Little Traverse Bay Bands of Odawa Indians, Grand Traverse Bay Band of Odawa and Chippewa Indians, Bay Mills Indian Community and Sault Ste. Marie Tribe of Chippewa Indians. This document is the record of WS' management decision based on the analysis in the new EA and agency response to public comments (Appendix A).

The EA documented the need for cormorant damage management (CDM) in Michigan and assessed potential impacts on the human environment from the various alternatives for responding to damage problems in Michigan, including the take of birds under the Double-crested Cormorant Public Resource Depredation Order (PRDO; 50 CFR 21.48). The analysis considered current and future CDM actions by WS, USFWS, NPS, MDNR, and the Tribes wherever they might be requested or needed within the State of Michigan. Comments from the public involvement process were reviewed for substantive issues and to ensure that appropriate alternatives were considered in developing this decision (Appendix A). The EA is tiered to the USFWS' 2003 Final Environmental Impact Statement (FEIS), "Double-crested Cormorant Management in the United States (USFWS 2003). WS was a formal cooperating agency on the FEIS and subsequently adopted the FEIS and issued its own Record of Decision (ROD) to support WS' program decisions for its involvement in the management of DCCO damage. Many of the issues addressed in the EA and public comments have also been considered in the FEIS.

Wildlife Services is selecting the proposed alternative, "Alternative 4 - Adaptive Integrated Cormorant Damage Management with Limited Annual Take (Proposed Alternative)", with modifications based on agency analysis of issues in public comments (Appendix A). Data on the Michigan cormorant population indicate the population has decreased from 30,208 pairs in 2005 to 28,580 pairs in 2007 and 18,220 pairs in 2009. Preliminary counts from sites where CDM was conducted in 2010 indicate that there was an approximately 20% decrease in the number of nesting pairs between 2009 and 2010. Given the

decreasing state DCCO population and that local DCCO populations continue to approach management objectives (Figure 1), a maximum annual take of 20,000 DCCOs for all types of damage management and scientific collecting permits (as proposed under Alternative 4 in the draft EA) appears to be more than what is needed. However, WS does believe that an increase in take beyond what is currently allowed would aid agencies and the tribes in attaining management objectives. Based on consultation with the USFWS, the total annual maximum take of DCCOs which may be taken for damage management will increase 5,000 birds per year to 15,500 birds instead of 20,000 birds. This includes an approximately 50% increase in the number of DCCOs which may be taken annually under the PRDO by the MDNR, WS and their agents and a similar increase in Tribal take under the PRDO. Under this modified alternative, the MDNR, WS or their agents may take up to14,000 birds per year under the PRDO; 750 birds may be taken under the PRDO by the Tribes; an additional 450 birds could be taken under Migratory Bird Depredation Permits; and 300 birds could be taken under Scientific Collecting Permits. Measures established in the EA for the protection of the state and Regional DCCO population (Section 1.5.8.1) will remain including a commitment to maintain no less than 5,000 breeding DCCO pairs and to preserve DCCO distribution throughout the state.

After review of public comments and agency responses (Appendix A), WS has also chosen to modify the management proposal for the Beaver Island Archipelago. As stated in the EA, the management objective for the Beaver Island Archipelago is to restore the smallmouth bass population and fishery and reduce overall foraging demand on the prey base of Lake Michigan. To achieve the management objective, the agencies proposed to reduce the archipelago-wide DCCO breeding population 50% each year and monitor fish population and fishery responses. The agencies acknowledge that the data on DCCO impacts to the fishery in this area is not optimal and have selected a more conservative management approach. The revised proposal is to reduce the population 50% per year to 3,000 breeding pairs for the archipelago and monitor the response of the fishery to this reduction. This is an approximately 74 % reduction from the 11,549 breeding pairs observed in 2007, and is likely to be of sufficient magnitude that an impact from the reduction in DCCO predation may be observed despite the numerous variables in the system. Observing the fishery response to a DCCO population maintained at a relatively constant level instead of a steadily decreasing DCCO population will also help to reduce the variability in the data analysis.

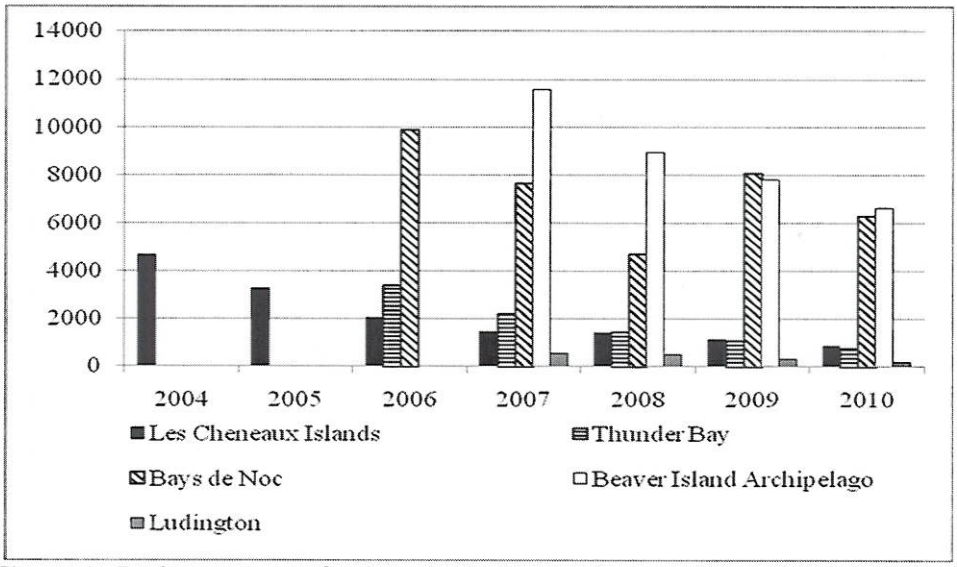

Figure 1. Peak nest counts for areas in Michigan where WS has conducted CDM. Data for 2010 are preliminary estimates.

After reviewing the available information, WS and the USFWS feel that the selected management alternative, including the above modifications, will allow for the effective implementation of CDM, including the adaptive management strategy proposed by the MDNR, and will reduce damage by and conflicts with DCCOs. This management strategy will also allow for the maintenance of a viable state, regional and national DCCO population, increase the information available regarding DCCO impacts to public resources, and provide protections for nontarget species and human health and safety.

The integrated wildlife damage management approach to be implemented under the preferred alternative, commonly known as Integrated Pest Management (WS Directive 2.105), involves the use of a combination of methods to reduce wildlife damage. WS' wildlife damage management is not based on punishing offending animals but is focused on reducing or preventing damage and is implemented by using a thought process described by the WS Decision Model (Slate et al. 1992, USDA 1997 revised, WS Directive 2.201). Resource management agencies, organizations, associations, groups, and individuals have requested assistance with CDM to protect private property and natural resources and to reduce risks to human health and safety in Michigan. All wildlife damage management activities will be conducted in compliance with relevant laws, regulations, policies, orders and procedures.

WS was the lead agency in the preparation of the EA, and is the Federal program authorized by law to reduce damage caused by wildlife (the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c)). Wildlife damage management is the alleviation of damage or other problems caused by or related to the presence of wildlife, and is recognized as an integral part of wildlife management (The Wildlife Society 1992). WS responds to requests for assistance from individuals, organizations and agencies experiencing damage caused by wildlife. Ordinarily, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions may be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, 1995). However, WS and the cooperating agencies decided to prepare the EA to assist in planning CDM activities and to clearly communicate with the public the analysis of cumulative effects for a number of issues of concern in relation to alternative means of meeting the need for action.

COOPERATING AGENCIES

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). The USFWS, including the Region 3 Division of Migratory Birds and Seney and Shiawassee National Wildlife Refuge, was a cooperating agency in the preparation of this EA. The mission of the USFWS is: "Working with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefits of the American people". While some of the USFWS's responsibilities are shared with other Federal, State, tribal, and local entities, the USFWS has special authorities in conserving migratory birds, endangered species, certain marine mammals, and nationally significant fisheries; managing the National Wildlife Refuge System; and enforcing Federal wildlife laws. The Migratory Bird Treaty Act (MBTA) gives the USFWS primary statutory authority to manage migratory bird populations in the U.S., including DCCOs. The USFWS is also charged with implementation and enforcement of the Endangered Species Act of 1973, as amended, and with developing recovery plans for listed species.

In response to persistent conflicts and complaints relating to DCCOs, the USFWS, in cooperation with WS completed the FEIS on the management of DCCOs in the U.S. in 2003 (USFWS 2003). Included in the selected management alternative were two depredation orders to address DCCO

damage. Only one of these - the Public Resource Depredation Order (PRDO) - applies to Michigan. The purpose of the PRDO is to reduce the actual occurrence, and/or minimize the risk, of adverse impacts of DCCOs to public resources. Public resources include fish (both free-swimming fish and stock at Federal, State, and Tribal hatcheries that are intended for release in public waters), wildlife, plants, and their habitats. It authorizes WS, State fish and wildlife agencies, and Federally-recognized Tribes (acting only on tribal lands) to control DCCOs without a Federal permit, in 24 States (AL, AR, FL, GA, IL, IN, IA, KS, KY, LA, MI, MN, MS, MO, NY, NC, OH, OK, SC, TN, TX, VT, WV, and WI). It authorizes control on "all lands and freshwaters." This includes private lands, but landowner permission is required. It protects "public resources," which are natural resources managed and conserved by public agencies, as opposed to private individuals.

The USFWS is responsible for ensuring that the agencies and Tribes authorized to act under the PRDO (1) do not threaten the long-term sustainability of regional DCCO populations, (2) do not adversely affect other bird species that nest or roost with DCCOs, (3) do not adversely affect Federally-listed species, and (4) comply with the terms and conditions of the PRDO, including notification and reporting procedures.

In addition to the depredation orders, the USFWS issues two kinds of Migratory Bird Permits that allow the take of DCCOs. Depredation permits can be used to address loss of private property (including private hatchery stock) and protection of human health and safety. Scientific collecting permits can be used to take birds for scientific research, such as assessments of DCCO food habits.

The mission of the National Wildlife Refuge System is to, "administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans". One unit of the Refuge System in Michigan is Michigan Islands NWR, which is administered by Seney and Shiawassee NWRs. This refuge was established under Executive Order 9337 in 1943 as a refuge and breeding ground for migratory birds and other wildlife. The refuge is comprised of eight islands in Lakes Michigan and Huron, including Gull, Pismire, Hat and Shoe Islands in northern Lake Michigan; Scarecrow Island and Thunder Bay Island in Thunder Bay; and Big and Little Charity Islands in Saginaw Bay. Scarecrow, Pismire, and Shoe islands were officially designated as Federal wilderness areas in 1970. Cormorants nest at Little Charity, Scarecrow, Gull, Pismire and Hat Islands.

United States Department of the Interior, National Park Service (NPS). The NPS is responsible for management of Sleeping Bear Dunes National Lakeshore, including South Manitou Island and the North Manitou Island Shoals Coast Guard Lighthouse which host nesting DCCOs.

The Organic Act creating the NPS states the agency will "conserve the scenery and the natural and historic objects and the wildlife therein and... provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 U.S.C. 1).

The Management Policies 2001 for the NPS state in Section 4.4.2, Management of Native Plants and Animals, "Whenever possible, natural processes will be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species. The NPS may intervene to manage individuals or populations of native species only when such

intervention will not cause unacceptable impacts to the populations of the species and when at least one of the following conditions exists:

- A population occurs in an unnaturally high or low concentration as a result of human influences and it is not possible to mitigate the effects of the human influences;
- There is a need to protect rare, threatened, or endangered species.

MONITORING

Wildlife Services, the MDNR, tribes and USFWS will monitor the impacts of their CDM activities on DCCOs and non-target species. The USFWS will annually assess the impacts of the PRDO and DCCO depredation and scientific collecting permits to ensure that cumulative CDM activities do not adversely impact the long-term sustainability of regional DCCO populations and that they are not adversely impacting non-target species. This will be based on review of USFWS permit records and annual reports submitted by agencies and individuals authorized to take DCCOs under the PRDO combined with periodic population monitoring efforts. In addition, the EA will be reviewed each year to ensure that there are no new needs, issues or impacts meriting additional analysis.

PUBLIC INVOLVEMENT

The EA was prepared and released to the public for a 30-day comment period via a legal notice placed on May 15-18, 2010 in the *Lansing State Journal*. WS also posted the EA and a notice of availability for comment on their web site http://www.aphis.usda.gov/wildlife_damage/nepa.shtml. A notification regarding the availability of the EA for public comment was also mailed directly to agencies, organizations, and individuals with probable interest in the proposed program. The USFWS Midwest Regional Office issued a press release to all news media and other interested parties in Michigan and provided a copy on the USFWS website (http://www.fws.gov/midwest/midwestbird/cormorants.htm). Fifty-four comment letters were received on the EA. Responses to comments are provided in Appendix A. All letters and comments are maintained at the Wildlife Services State Office in Okemos, Michigan.

MAJOR ISSUES

The following issues were identified as important to the scope of the analysis (40 CFR 1508.25). The EA analyzed the impacts of each CDM alternative relative to these issues.

- Effects on DCCO populations
- Effects on other wildlife (and plant) species, including T&E species
- Effects on human health and safety
- Effects on aesthetic values
- Humaneness and animal welfare concerns of the methods used

AFFECTED ENVIRONMENT

The proposed action may be conducted on properties held in private, local, state or federal ownership. The areas of the proposed action could include areas in and around public and private facilities and properties and at other sites where DCCOs may roost, loaf, feed, nest or otherwise occur. Examples of

areas where CDM activities could be conducted include, but are not necessarily limited to: aquaculture facilities; fish hatcheries; lakes; ponds; rivers; swamps; marshes; islands; communally-owned homeowner/property owner association properties; boat marinas; natural areas; national wildlife refuges (Shiawassee and Michigan Islands NWRs); state wildlife management areas; and airports and surrounding areas. WS may conduct breeding bird control activities in any DCCO breeding colony site in Michigan, including any of the breeding sites currently identified throughout the state (USDI/USGS 2001, Weseloh et al. 2005), with landowner permission. This may include sites within the Les Cheneaux Islands, Thunder Bay and Saginaw Bay regions of Lake Huron; Bays du Noc, Beaver Islands, Bellows Island, Paquin Island, Naubinway Island and the Ludington Pumped Storage Project in Lake Michigan; Tahquamenon Island in Lake Superior; and Gem and Rock Islands in the St. Marys River. These sites include nesting locations identified by Wires and Cuthbert (2001) as high priority for the conservation of colonial waterbirds in the U.S. Great Lakes. WS will consult the USFWS before undertaking CDM activities at the high-priority sites.

ALTERNATIVES THAT WERE FULLY EVALUATED

Five alternatives were developed to respond to the issues. WS and the USFWS have made separate decisions regarding the alternative to be selected. The following is a summary of the alternatives.

Alternative 1. Integrated CDM Including Implementation of the PRDO (No Action Alternative)

As defined by the CEQ, the no action alternative can be interpreted as the continuation of current CDM practices (CEQ 1981). This alternative would continue current CDM activities in Michigan that have included working under the PRDO and Migratory Bird Permits. An integrated wildlife damage management (IWDM) approach would be implemented to reduce DCCO damage to and conflicts with public resources, aquaculture, property, and human health and safety. The IWDM strategy would encompass the use and recommendation of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment.

Under this alternative, the lead and cooperating agencies could provide technical assistance and direct operational damage management, including nonlethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification, nest destruction, or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed through use of shooting, egg oiling/addling/destruction, or euthanasia following live capture. In determining the damage management strategy, preference would be given to practical and effective nonlethal methods. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of nonlethal and lethal methods, or there could be instances where the application of lethal methods alone would be the most appropriate strategy.

The primary strength of this alternative and the IWDM approach is that it allows for access to the full range of CDM techniques when developing site specific management plans. However, under this alternative, an agency could decide to only use a subset of the possible CDM methods for the management of DCCO damage at a specific site. For example, it would be possible to use only nonlethal techniques at specific sites. Selection of this alternative also does not obligate any agency to work to implement the MDNR management objectives (Section 1.5.8) at all sites under

their jurisdiction. Refuge staff could choose to restrict their actions under this alternative to responding to and discouraging DCCO activity at vegetated NWR islands, and not conduct CDM at other large colony sites.

Cormorant conflict management activities would be conducted in the State, when requested and funded, on private, public or tribal property, after receiving permission from the landowner/land manager. All management activities would comply with appropriate Federal, State, and local laws. The USFWS would be responsible for ensuring compliance with the PRDO and MBPs and that the long-term sustainability of regional DCCO populations is not threatened. Except as noted above for land management agencies, selection of this alternative by any of the agencies would not restrict the management options available to the other agencies. However, if a landowner/ manager does not grant permission for access to a Great Lakes island, DCCOs from that island may still be shot if they are more than 500 yards from shore.

Implementation of the PRDO: If this alternative is selected, the agencies could work to meet the management objectives set in Section 1.5.8 under the authorities established in the PRDO. However, the maximum lethal DCCO take allowed under the PRDO for this alternative, 9,700 DCCOs per year, would not allow for simultaneous implementation of the MDNR adaptive management strategy (e.g., 50% annual reductions in the number of breeding pairs at Bays de Noc and Beaver Islands) at all sites described in Section 1.5.8.

This alternative would include regular monitoring of the results and impacts of CDM efforts in Michigan and review of new information from the literature. Management methods and objectives would be adjusted as needed based on available information. This process would include review of the EA to determine if the analysis adequately addresses current conditions and plans. The EA will be supplemented or replaced as needed in accordance with APHIS, USFWS and NPS NEPA implementation procedures.

Carcasses of DCCOs killed during CDM would be disposed of in accordance with applicable Federal, State and local regulations and applicable permits. Disposal methods could include burial at landfills, incineration, composting or donation for research projects. Composting would be conducted in accordance with applicable state, federal and local laws and regulations.

Alternative 2. Only Nonlethal CDM by Federal Agencies

Under this alternative, the Federal agencies would only use, recommend and permit nonlethal techniques for CDM. WS would not assist with the site evaluations and completion of WS Form 37 required by the USFWS for a MBP. The USFWS would not issue MBPs for lethal techniques to resolve conflicts with DCCOs or scientific collecting permits for projects using lethal methods. The NPS and NWRs would not use or permit the use of lethal CDM on their lands. Permits are not required from the USFWS for nonlethal CDM techniques so access to these methods would not change.

The USFWS FEIS on DCCO management permits PRDO actions that will result in the take of less than 10% of a DCCO colony (USFWS 2003). Decisions made by the USFWS in this EA cannot affect this type of CDM action on non-federal land. The MDNR and tribes could still act as action agencies under the PRDO and could use lethal methods to take up to 10% of the birds in a colony in combination with nonlethal methods to try to meet management objectives (Section 1.5.8) on non-Federal lands. Lethal methods used by the MDNR and tribes would be subject to the same use restrictions described for Alternative 1 (e.g., requirements for landowner

permission, minimum population thresholds, provisions for protecting nontarget species, etc.). Egg oiling involves killing the developing fetus and, as such, is a lethal CDM method. As with other lethal techniques, egg oiling could be used by the State and tribes, but would not be used by the Federal agencies, nor would it be used on Federal lands. Overall management objectives for the CDM in Michigan would be as described for Alternative 1.

Alternative 3. Adaptive Integrated Cormorant Damage Management

Under this alternative, an integrated damage management approach would be used to reduce damage by and conflicts with DCCOs in Michigan. The adaptive management program described in Sections 1.5.8 and 3.1 would be implemented. Up to 50% of the local breeding population could be removed per year in sites targeted for CDM under the PRDO for the protection of public resources until the management objectives for the site have been reached. There would be no maximum limit on the number of DCCOs that could be taken per year so long as the number of breeding pairs in the State was not reduced below 5,000 pairs. Local breeding populations consisting of only 1 breeding colony would not be reduced below 100 breeding pairs. Local breeding populations consisting of more than one colony would not be reduced below 200 pairs. In instances where the local breeding population is comprised of one colony, lower management objectives may be implemented if DCCO presence jeopardizes vegetation of ecological value (e.g., threatened or endangered plants, vegetation used by threatened or endangered species or species of conservation concern). These instances would be rare and would only be implemented after consultation with the Michigan Interagency Cormorant Coordination Group. Additionally all action agencies agree to consult with the USFWS prior to conducting CDM at "priority sites for water bird conservation" as identified in Wires and Cuthbert (2001).

Methods that could be used for CDM, restrictions on their use, and the use of the WS Decision Model would be as described for Alternative 1. The number of birds that could be taken under Scientific Collecting Permits (500) would be the same as for Alternatives 1 and 4. Based on increasing complaints from landowners, the number of birds that might be taken under depredation permits has been increased to 500 birds per year. Carcass disposal would also be handled as described for Alternative 1.

Alternative 4. Adaptive Integrated Cormorant Damage Management with Limited Annual Take (Proposed Alternative)

Cormorant damage management actions under this alternative would be identical to Alternative 3 except that the maximum number of DCCOs that could be taken under the PRDO would be limited to 14,750 birds per year. This cap on take was estimated based on DCCO nest numbers in Table 1-1, management objectives proposed in Section 1.5.8, limits on access to some DCCO colonies, and an understanding of the resource limitations of the action agencies. In addition to the birds which may be taken under the PRDO, 300 DCCOs per year may be taken under Scientific Collecting Permits and 450 DCCOs under Migratory Bird Depredation Permits.

Alternative 5. No Federal CDM

Under this alternative, the Federal agencies would not participate in CDM. WS would not conduct the consultations or complete the forms required by the USFWS to issue MBPs and the USFWS would not issue MBPs. Nonlethal CDM techniques could still be used without a permit. Information on CDM methods would still be available through other sources such as USDA

Agricultural Extension Service offices, USFWS, MDNR, universities, or pest control organizations.

As with Alternative 2, the USFWS would not grant approval for actions conducted under the PRDO that propose the take of more than 10% of the local DCCO population. Decisions made by the USFWS in this EA cannot affect this type of CDM action on non-Federal land. The MDNR and tribes could still act as action agencies under the PRDO and could use lethal methods to take up to 10% of local DCCO colonies in combination with nonlethal methods to try to meet management objectives (Section 1.5.8) on non-Federal lands. No CDM would be conducted on NPS or NWR lands because Federal agency approval would be needed for any activities at those locations. Overall management objectives for CDM in Michigan would be the same as described for Alternative 1.

DECISION AND RATIONALE

I have carefully reviewed the EA prepared for this proposal and the input from the public involvement process. I believe that the issues identified in the EA and in public comments are best addressed by selecting Alternative 4 (Preferred Alternative) with modifications discussed in this record and the associated Standard Operating Procedures discussed in Chapter 3 of the EA. This alternative was selected because (1) it enables WS and cooperators to effectively address damage by and conflicts with cormorants while minimizing cumulative impacts on the quality of the human environment that might result from the program's effect on target and non-target species populations; (2) it presents the greatest chance of maximizing net benefits to public health and safety while minimizing adverse impacts to target and non-target species populations; and (3) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of these issues are considered. The public comments were considered and, where appropriate, changes were made to the EA and selected alternative. Impacts of the changes were similar to or intermediate to alternatives analyzed in the EA (Alternatives 1 and 4) and do not warrant additional review or analysis pursuant to NEPA.

FINDING OF NO SIGNIFICANT IMPACT

Many of the issues analyzed in the EA were also analyzed in the FEIS (USFWS 2003). The analyses in the EA indicate that there will not be a significant impact, individually or cumulatively, on the quality of the human environment as a result of actions proposed in the EA that were not already considered in the FEIS. I agree with this conclusion and therefore find that an EIS need not be prepared. This determination is based on the following factors:

1. Cormorant damage management as proposed by WS and the other action agencies in Michigan is within the parameters analyzed in the FEIS (USFWS 2003).

2. The proposed action would pose minimal risk to public health and safety. Risks to the public from WS methods were determined to be low in a formal risk assessment (USDA 1997, Appendix P).

3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected. Built-in mitigation measures that are part of the action agencies' standard operating procedures and adherence to laws and regulations will further ensure that the agencies' activities do not harm the environment.

4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to CDM, this action is not highly controversial in terms of size, nature, or effect. Public controversy over cormorant management has been acknowledged and addressed in the FEIS and the EA.

5. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks. The issue of uncertainty about effects of DCCO management in general has also been addressed in the FEIS.

6. The preferred alternative would not establish a precedent for any future action with significant effects.

7. No cumulative effects were identified through this assessment that were not consistent with analyses in the FEIS. The FEIS analyzed impacts of the CDM program on the DCCO population and determined that impacts on national and regional DCCO populations and other species from implementing CDM would not be significant. The EA contains provisions to ensure that the proposed action does not jeopardize the viability of the state DCCO population. The EA also discussed cumulative effects on non-target species populations and concluded that such impacts were not significant for this or other anticipated actions to be implemented or planned within the State.

8. The proposed activities would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources. If an individual activity with the potential to affect historic resources is planned under the selected alternative, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary (Section 1.9.2 of EA).

9. The USFWS has determined that the proposed program would have no effect on or is not likely to adversely affect any federally-listed threatened or endangered species. This determination is based upon Intra-Service Section 7 Biological Evaluations completed by the USFWS for the FEIS and this EA. WS and the other action agencies will abide by the conservation measures provided in 50 CFR 21.48(d)(8) and the Intra-Service Section 7 Biological Evaluation for CDM in Michigan to avoid adverse impacts to bald eagles and piping plovers in Michigan. In addition, WS and the MDNR have determined that the proposed program will not adversely affect any Michigan state-listed threatened or endangered species.

10. The proposed action would be in compliance with all Federal, State, and local laws.

Copies of the EA are available upon request from the USDA Wildlife Services Office, 2803 Jolly Road – Suite 100, Okemos, MI 48864, Phone (517) 336-1928, FAX (517) 336-1934, and on the USFWS Regional Office website at: http://www.fws.gov/midwest/MidwestBird/cormorants.htm, or from the U.S. Fish and Wildlife Service, Division of Migratory Birds, 1 Federal Drive, Fort Snelling, MN 55111-4056.

Charles S. Brown, Regional Director
USDA-APHIS-WS, Eastern Region

6/14/11
Date

APPENDIX A
RESPONSES TO COMMENTS

This appendix contains issues raised by the public during the comment period for this EA and the agencies' response to each of the issues. Material in this appendix is duplicated in Chapter 6 of the Final EA[1]. The agencies received 54 comment letters regarding the EA. Comments from the public are numbered and are written in bold text. The agencies' response follows each comment and is written in standard text.

The EA (Section 2.1.4) notes that the public reaction to wildlife damage management is variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes and opinions about the aesthetic and utilitarian values of wildlife, and the best ways to reduce conflicts/problems between humans and wildlife. The diversity of opinions regarding wildlife and wildlife management was reflected in letters advocating for and against CDM and the proposed CDM program. Comments ranged from expressions of pleasure at the increase in DCCO numbers and the opinion that the increase was a sign of the improving health of the Great Lakes ecosystem to expressions of dismay at another adverse impact on the native ecosystem by a species perceived to be present in artificially high numbers because of the abundance of non-native fish for forage. Despite the diversity of values and opinions, the common theme in all the letters was the authors' passionate concern for the well-being and future of the state's natural resources, a concern shared by the lead, cooperating and consulting agencies.

1. Why aren't clubs allowed to organize lethal eradication of DCCOS and why isn't there a hunting season for DCCOs? The PRDO only authorizes States, Tribes, WS and their designated agents to conduct CDM. The EIS on cormorant management (USFWS 2003) did consider the use of hunting seasons, but chose to not to make hunting seasons available as a management option (EIS Response to comment 6, USFWS Final Rule Response 15).

2. Can our club or organization help with conducting CDM under the PRDO? Yes, but only as a designated agent of the MDNR, WS or the tribes. As discussed in EA Section 1.5.3.10, WS has developed a volunteer program that uses hazing and limited lethal removal to reduce DCCO foraging in areas where smaller-sized fish such as yellow perch and sunfishes are spawning in shallow water and very vulnerable to DCCO predation. The volunteers work as designated agents of WS and are required to go through a mandatory annual training program, and comply with project restrictions (e.g., emphasis is harassment with only occasional shooting to reinforce harassment) and reporting requirements to participate. These efforts are conducted during the migration peak in mid April and early May. This approach has been used at Drummond Island, Brevoort Lake, Big Manistique Lake, South Manistique Lake, Indian Lake, Long Lake and Grand Lake and appears to be quite successful. A similar program is conducted by the Bay Mills Indian Community at Waishkey Bay.

3. Hazing programs don't work because, when the weather is bad, the crews don't go out and the DCCOs get all the fish. We understand that hazing programs have their limitations. However, safety of volunteers and agency personnel must always be a priority and hazing cannot be conducted under unsafe conditions. Additionally, due to agency resource limitations, harassment programs are commonly conducted by volunteers who may be unable or unwilling to haze birds in inclement weather. However,

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1 Chapter 6 of the EA is provided in this document instead of reprinting the entire EA to reduce costs and use of paper. Copies of the final EA may be obtained at the USFWS web site (http://www.fws.gov/midwest/MidwestBird/cormorants.htm), the WS website (http://www.aphis.usda.gov/regulations/ws/ws_nepa_environmental_documents.shtml) or by contacting USDA, APHIS, WS, 2803 Jolly Rd., Suite 100, Okemos, MI 48864.

despite these limitations, we believe the harassment programs provide far more site-specific protection for fish than if DCCOs were allowed unlimited access to the fish. A study by Dorr et al. (2010) of the hazing program at Drummond Island and Brevoort Lake indicated that cormorant foraging at the sites decreased DCCO foraging attempts an average of 90%. Walleye and yellow perch abundance increased significantly at Drummond Island after the program was initiated. Similarly, the number of age 3 walleye at Brevoort Lake increased to record levels in 2008 after 3 years of DCCO harassment.

4. Egg oiling as currently practiced is not having an adequate impact, especially in Bays de Noc. Agencies also need to shoot DCCOs. Shooting has been used in combination with egg oiling and nest destruction in the Bays de Noc area since 2007 (EA Section 1.5.3.3). The number of adults killed each year under the current management alternative has been approximately 10% of the local breeding population. Increased levels of shooting are proposed for this area under Alternatives 3 and 4. The number of nesting DCCOs in Bays de Noc has decreased from approximately 9,850 pairs in 2006 to 6,390 in 2010.

5. DCCOs should be eliminated or at least severely reduced. They are a non-native species and have no natural enemies to keep them in check. What good is a DCCO? Double-crested Cormorants are native to North America and have been listed as a protected species under the Migratory Bird Treaty Act since 1972 (Section 1.5.1). DCCOs, as a predatory species, are an integral part of a diverse and healthy native ecosystem (USFWS 2003). They have the same predators as other colonial-nesting waterbirds. Islands tend to be preferred nesting sites to reduce risks from mammalian predators, but there is still predation risk on the islands. Gulls prey on eggs and chicks. Bald Eagles have also been observed preying on DCCOs.

Cormorants have inherent value regardless of their use to humans (USFWS 2003, EA Section 2.1.4). As the wildlife biologist Aldo Leopold famously said, "If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering." Given that cormorants are a species native to Michigan, it is reasonable to expect that they serve a role in Great Lakes ecosystems, whether that role is fully understood or appreciated or not. Further, the people of the United States of America, through treaties negotiated by their elected officials, have indicated that conservation of native migratory birds is a fundamental priority for its own sake, regardless of economic values. The importance of DCCOs in native ecosystems and to the people of Michigan was noted when DCCOs were protected under the state endangered species law from 1976 until 1985.

Cormorants also have aesthetic value for individuals who enjoy watching migrating birds and large waterbird colonies. According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 3.2 million individuals annually participate in wildlife watching activities in Michigan, including 2 million individuals who reported engaging in bird watching. Wildlife watching generated approximately $1.6 billion annually for Michigan's economy (USFWS 2006). This is comparable to the $1.7 billion generated by angling. A number of bird watching resources identify sites where cormorants may be viewed in Michigan during the migration and breeding seasons, indicating that birdwatchers have an interest in visiting sites where cormorants may be seen. While not all wildlife watching dollars are generated by cormorant viewing, neither are all angling dollars at risk from current or potential impacts of cormorant foraging.

Complete eradication of DCCOs is not an ecologically or sociologically acceptable solution to DCCO conflicts. Although the individual CDM actions proposed under alternatives 1, 3 and 4 would have the cumulative impact of reducing the state DCCO population, the EA contains sufficient protective measures to ensure the continued viability of the population (EA Section 1.5.8.1).

6. Why is the federal government involved in CDM? DCCOs should be managed by the state, not the federal government. The federal government doesn't care what damage DCCOs do on a local level. The USFWS has authority for managing DCCOs granted by Congress in the Migratory Bird Treaty Act. The possibility of removing DCCOs from the list of birds protected under the MBTA was considered but not analyzed in detail in the EIS (EIS response to comments 5 and 10). The USFWS understands the potential impacts DCCOs can have on property and natural resources. Concerns about the damage caused by DCCOs prompted the USFWS to prepare an EIS on methods to facilitate reducing local DCCO damage to property and natural resources. The EIS established the PRDO which granted states, WS and the tribes increased authority to manage cormorant damage. However, the USFWS cannot grant the state "full authority" without abdicating its responsibility under the MBTA. Wildlife Services does not have regulatory authority for wildlife management. WS provides assistance with wildlife damage management when a need exists and assistance is requested in accordance with applicable local, state and federal regulations. WS has been providing assistance with CDM in Michigan since 2004. The EA does consider an alternative under which WS would discontinue current efforts and not be involved in CDM in Michigan (Alternative 5).

7. There should be places, like our national wildlife refuges, where native wildlife are protected. Permitting CDM on national wildlife refuges is in direct opposition to the purpose of these sites. The mission of the USFWS is, "Working with others to conserve, protect, and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people". National Wildlife Refuges are established for various reasons and often cite specific species in enabling legislation. However, this does not diminish our responsibility to protect and provide for all native species of wildlife using these areas. Occasionally there are species population fluctuations (numbers and/or spatial) that negatively impact other species or their habitats. Any action on Refuge lands is closely monitored by Service and other agency's biologists and is conducted to conserve the diversity of native species and their habitats. Finally, CDM will never be allowed to the point of endangering the population of cormorants. (Response merged with another question/response).

8. All CDM done under the PRDO should be carried out by trained biologists with their trained volunteers using humane methods, and with lethal methods used as a last resort. The PRDO only allows states, tribes, WS and their designated agents to conduct CDM for the protection of public resources. All agency and tribal personnel are trained in the safe and effective use of CDM techniques. Volunteers who participate in the hazing programs must attend annual training on cormorant biology, bird identification, federal state and local regulations applicable to the cormorant hazing program and proper use of hazing methods.

The EA notes that preference is given to nonlethal methods where practical and effective. However, while nonlethal alternatives are desirable, there are relatively few nonlethal methods which may be used without adversely impacting nontarget bird species that nest near DCCOs. Methods such as physical exclusion or harassment cannot be used in most waterbird colonies because of the potential for adverse impacts on co-nesting species.

9. The Interagency Cormorant Coordination Group is inadequate and biased because it has no representatives from groups that might have an opinion different from the cormorant suppression mindset of the agencies. The purpose of the Interagency Cormorant Coordination Group is to coordinate the activities of the agencies authorized to act under the PRDO. There are multiple independent agencies in Michigan that may conduct CDM and actions conducted by one entity may impact actions conducted by others. Management actions must be coordinated to ensure that overall take does not exceed allowed levels. Non-government organizations and private individuals are not included on this group as they are

not allowed to lethally take cormorants except, possibly, as agents of the designated action agencies (e.g., WS, the MDNR and the Tribes). The group provides a forum for exchange of information and discussion regarding proposed actions and ways to achieve program goals while minimizing risks of potential adverse impacts from CDM. Annual management recommendations by the MDNR are developed based on input from the public, collected fishery data and data analysis, collected data on cormorant colonies and migrating cormorant flocks, available management techniques, and available funding and staff. Any resident of the state of Michigan may contact the MDNR to provide feedback on resource management issues. The USFWS and WS are similarly open to public comment on management actions. Tribal agencies are similarly accountable to their members and tribal leaders. Although the agencies comprising the working group work cooperatively together on DCCO management issues in Michigan, each agency retains its own authority to make management decisions.

10. Objectives wrongly omit any effort to increase public understanding of the role of DCCOs in the environment and increase tolerance for this species. Killing more birds with no substantial reason to do so just perpetuates the idea that the DCCO is a "bad" bird and the cycle of ignorance. Based on analysis in the EA and responses to comments, the agencies do not agree that the proposed CDM actions are being conducted without substantial cause. EA Section 3.4.1 specifically addresses educational efforts as an integral part of CDM along with research, technical assistance (advice) and direct damage management. Open lines of communication are maintained between the action agencies and stakeholder groups which have strong feelings regarding cormorant management. Discussions have been held with many of these groups to better inform them of the current knowledge of the role of cormorants in Great Lakes food chains, ongoing management activities, and available management options. Wildlife Services includes information on the status of DCCOs as a native species and the fact that DCCOs are not responsible for all fishery declines in their presentations. The MDNR has developed informational publications, produced press releases, and communicated with journalists on the subject of cormorant management. Personnel from WS and the USFWS have similarly participated in public meetings and interviews with journalists, and developed fact sheets on DCCO management. The publications are available to all, and attempts are made to ensure that these products are unbiased to the extent possible.

11. The MDNR and WS should reevaluate their attitude toward DCCO control. There are far more important issues at play in the Great Lakes that deserve attention. The amount of money spent controlling DCCOs should be put to other more deserving projects. Michigan Department of Natural Resources and Environment priorities are driven by a number of factors including risks to public resources, available opportunities for conservation, values of the residents of Michigan, and the availability of resources to conduct projects. Decisions to conduct cormorant damage management activities are driven by a concern for the impacts of this species on other public resources (primarily fish, but concerns about vegetation and co-nesting species have also factored into management recommendations) and input from private citizens and their elected representatives at the local, county, state, and federal level regarding the values they place on cormorants, their prey, and their environment. Given these factors, it would be negligent for the MDNR not to examine the current status of cormorants in Michigan and make recommendations for their management to ensure the conservation, protection, management, accessible use and enjoyment of the State's natural resources for current and future generations. The WS program is a cooperatively funded, service-oriented program and does not have regulatory authority. Wildlife Services provides federal leadership and assistance in wildlife damage management when requested by the applicable landowner/manager or agency. Wildlife Services conducts CDM in Michigan in accordance with objectives established by the applicable landowner or resource manager/agency and the provisions of the PRDO.

12. The EA fails to present a valid "no action" alternative as required by NEPA. The only thing that comes close is Alternative 5 which would still allow state agencies and the tribes to take DCCOs. As stated in EA Section 1.6, this document is tiered to the USFWS EIS (USFWS 2003) which resulted in the establishment of the PRDO. The purpose of this EA is to review alternatives for implementing the decisions made in the USFWS FEIS and final rule and to provide more site-specific analysis of program impacts. As noted in Sections 3.3.2 and 3.3.5, state and tribal authority to take up to 10% of a local breeding population was granted in the PRDO. Although WS can choose to not participate in CDM in Michigan (Alternative 5), and the Service retains oversight authority, modification of the PRDO and authorities granted in the Order are outside the scope of this analysis. The "No Action" alternative analyzed in the EA (Alternative 1) is consistent with CEQ direction which states that the "No Action" alternative may be interpreted as the continuation of existing practices (CEQ 1981).

13. There is no scientific justification for any of the alternatives. EA wrongly portrays natural functioning of ecosystem as "damage". Labeling these functions as "damage" creates a perception which is not universally accepted. The agencies and tribes recognize the importance of resource management being science-based. In this analysis, the agencies and tribes relied on scientific studies as well as the best available biological knowledge and expert opinion to make their decisions. Additionally, social, political and economic factors contribute to agency and tribal decisions. What constitutes "sufficient" evidence to justify DCCO control is, to a certain extent, a question of values. Among stakeholders concerned with DCCO management we can safely say there is considerable disagreement over whether or not the proposed action is justified (with some even arguing that the proposed action does not go far enough). The USFWS and WS, as the lead and cooperating agencies on the EIS (USFWS 2003) and this EA jointly agree that there is sufficient evidence to justify the proposed action.

As noted in Response 5, the agencies agree that DCCOs are a native species and an important part of a healthy native ecosystem. Cormorant activities and use of resources coincide with those of people. Agencies such as the MDNR, USFWS and WS are charged with the responsibility of sustaining healthy ecosystems while also addressing the diverse and sometimes conflicting human expectations from the nation's natural resources. The agencies understand and acknowledge that DCCO actions which may be perceived by some members of the public as an adverse impact on their use or enjoyment of natural resources (damage), is perceived by others as part of the normal ebb and flow of a dynamic ecosystem. Plant and animal community composition, population numbers and distribution, are in a constant state of change. During pre-settlement times, these processes were self-regulating. However, today because of the vastly altered landscape, management actions must sometimes be taken to keep species in balance with the available habitat, or to mitigate unacceptable damage to other species that are in decline due to loss of habitat. The proposed action does not involve eliminating DCCOs or the important role they play in ecosystems, but rather is intended to use an adaptive management approach which will allow for continued support of DCCOs and other colonial waterbirds and their habitats.

14. The EA provides no suggestion that humans should modify their attitudes to co-exist with DCCOs. Coexistence with DCCOs is fundamental to all the alternatives under consideration. The agencies and tribes firmly believe that DCCOs are an essential component of a healthy ecosystem (Response 5 above) and that any CDM alternative considered must not jeopardize the viability of the state, regional or national DCCO population. The general goals established by the agencies and tribes (Section 1.5.8.1) establish a 5,000-pair minimum population for Michigan and also mandate preservation of the distribution of DCCOs throughout the state. Compliance with these objectives necessitates a degree of coexistence between humans and DCCOs. The alternatives under consideration vary in the degree to which CDM will be conducted in the state, the resulting impacts on local DCCO populations, and DCCO impacts on affected resources. In other words, the alternatives vary in the degree to which people who feel they are adversely being impacted by DCCOs are expected to coexist with local DCCO

populations. Additionally, all alternatives under consideration include a public education component which includes information on the importance of DCCOs in ecosystems, the existence value of DCCOs and the value of DCCOs and bird-watching to non-consumptive users (Response 10 above).

In the EIS, the USFWS considered, but rejected for further analysis, an alternative in which no CDM would be conducted (EIS Section 2.5.1). In making the decision to eliminate this alternative from further study, the USFWS stated that, "to implement this alternative would be to ignore conflicts associated with cormorants that must be addressed if we are to fulfill our duties to manage America's migratory birds responsibly. Since there is real biological and socioeconomic evidence...justifying the need for DCCO management, we find this alternative to be unreasonable".

15. DCCOs are having an adverse impact on the fishery in the Bays de Noc/Escanaba area. Fish populations of particular concern are brown trout, splake, perch, walleye, and smallmouth bass in shallow-water areas. The stocking of splake was discontinued in 2008 due to long-running poor performance in Lake Michigan. Regarding the other species, the MDNR is also concerned regarding the impact of DCCOs on these species in Bays de Noc. This issue and proposed management strategy are presented in EA sections 1.5.3.3 and 1.5.8.2.

16. Stocked fish, including fish in Bays de Noc and Bear River in Petoskey, are not making it to harvest. Large numbers of DCCOs at stocking areas are taking all the fish. The MDNR, tribes and WS are working with partner groups around the state to protect stocked fish at the time of stocking in specific areas. The MDNR has also established a reporting system where individuals can report concentrations of DCCOs at http://www.dnr.state.mi.us/cormorantobs/. Risks to fish at stocking sites and spawning areas are addressed in EA Sections 1.5.3.10. See Response 2 above.

17. There appear to be declines in Chinook in the Ford River area. Chinook salmon stocks in Lake Michigan are declining as expected based on recent management decisions to stock less fish in order to provide for a better balance between predators and prey.

18. With all the major impacts on the Great Lakes Fishery, why are only DCCOs being targeted and not the other causes of fisheries problems? Agencies should address greater underlying issues impacting the fisheries such as the impacts of invasive fish and mussels. There is no single factor that can be pinpointed to cause fish community fluctuations. It is typically a mix of abiotic and biotic factors, and we can make some fairly strong predictions regarding the impacts cormorants have on fish populations through their daily consumption. The agencies are aware that other factors such as invasive species (e.g., quagga and zebra mussels and round goby) are also having substantial impact on Great Lakes ecosystems, and the agencies are acting within the limits of available technology and resources to address these issues. For example, the MDNR is working with federal regulators to get improvements in the regulations governing ballast water and other vectors for invasive species. State fisheries management agencies have also decreased the number of predatory fish stocked in the Great Lakes in order to keep fish stocking in balance with the available forage base. The proposed CDM projects are another facet of this effort. Based on available data in the EA and review of the literature, the agencies have concluded that there is sufficient evidence to believe that DCCOs are contributing substantially to declines in fishery resources and that reducing DCCO predation will have a positive impact on the fishery. The proposed adaptive management approach will allow for positive impacts on the fishery while ensuring the program does not jeopardize the viability of state, regional and national DCCO or nontarget species populations.

19. What about DCCO damage to fisheries in areas not specifically mentioned in the EA including the Menominee River and inland lakes such as Houghton Lake. The management objectives and

analysis presented in the EA include provisions for CDM to be conducted at sites in addition to those specifically addressed in the EA (Section 1.5.8.5, 1.7.4). New projects may be added so long as CDM is permitted under the selected alternative and individual and cumulative impacts remain within the parameters established and analyzed in the EA. Action agencies would consult with one another through the ICCG prior to initiating new CDM projects under the PRDO and would comply with the USFWS notification and review requirements for implementation of the PRDO.

20. Cormorants are having an adverse economic impact and there is job loss associated with fishery declines caused by DCCOs. The agencies understand that when DCCOs adversely impact fish populations there can be substantial adverse economic impacts on the community, including decreases in recreation and associated losses in business revenue and jobs. Shwiff et al. (2009) evaluated DCCO impacts on the Oneida Lake Region of New York. Studies have documented DCCO damage to recreational fishing in Oneida Lake (VanDeValk 2002, Rudstam et al. 2004.). Total estimated revenue lost to the Oneida Lake Region from 1990-2005 ranged from $100 million to $500 million (in 2008 dollars) and estimated job loss for the period ranged from 3,000-12,000. Costs and impacts of DCCOs and DCCO foraging on jobs in Michigan will depend on a number of variables including the extent to which DCCOs are contributing to observed fishery declines and impacts of individual fisheries on local economies. As noted by one commenter, reductions in fish populations can also have impacts not commonly considered in economic analyses including adverse effects on community events and fundraisers such as fish dinners and fish boils for charity. The challenge in complex systems like the Great Lakes which are impacted by many factors including invasive species and water quality concerns, is to determine the cause(s) of the decline and the extent to which DCCOs are contributing to the problem. (See also responses 18, 21, 27)

21. There is no unequivocal evidence that DCCOs are the crux of the problems in the Beaver archipelago. Given the highly complex and dynamic nature of the Lake Michigan ecosystem, time frames required for data collection and the constraints on agency resources, *unequivocal* evidence is unlikely to ever be available. When establishing the PRDO the USFWS specifically stated that they did not expect agencies to wait until impacts occur and are proven with absolute certainty before they are allowed to manage DCCOs (EIS Chapter 7, Issue 53). One of the benefits of the PRDO is that agencies in areas where the risks of adverse DCCO impacts are greatest are given more flexibility in taking action, including preventive action (EIS Chapter 7, Issue 53). Based on information provided in the EA and responses to comments, the agencies believe there is reasonable cause to believe that DCCOs may be having an adverse impact on fisheries in the Beaver Archipelago. (See Response 13).

22. Removing DCCOs may have adverse unintended consequences, as argued in the EA for alewives. For example, at present, the primary diet item for DCCOs in the Beavers is the invasive round goby, which eats the eggs and fry of native sport fish. DCCOs are providing a benefit by eating invasive species. Because of their opportunistic feeding, DCCOs may play an important role in controlling Asian carp populations. While the agencies agree that manipulation of predator prey systems should be undertaken with caution, the available evidence does not support the hypothesis that DCCOs can control the round goby population or prevent the establishment of Asian carp. Round goby populations were first documented in the Great Lakes (St. Clair River) in 1990 and, by 1995, gobies were found North of Chicago and in Duluth, Minnesota (USDA 2011, USGS 2000, INHS 1995). The productivity of the species is so high that populations have exploded to their present levels with current and higher numbers of DCCOs feeding in the Great Lakes and no CDM conducted for the protection of free-swimming fish populations until 2004 (EA Sections 1.5.7). Consequently, it seems unlikely that DCCOs have or can limit goby populations or reduce negative goby impacts on other resources. Goby and alewife population trends are likely controlled by factors other than DCCO. DCCOs are opportunistic feeders and cannot access all parts of most lakes, especially deep lakes like the Great Lakes.

Consequently, they are unlikely to take a substantial number of Asian carp until the species is well established in the ecosystem.

It should also be noted that invasive fish such as the round goby do not appear to be the predominant DCCO food item in all areas where CDM is conducted (M. Ebener, CORA, unpub. data). Biologists working with CORA identified 9,927 fish in regurgitant samples collected from Rock and Gem Islands in the St. Marys River during 2007-2008. Based on numbers of fish identified, unidentified shiners comprised the majority of fish collected at Rock Island (99%). Rainbow smelt (33% of fish counted), yellow perch (20%) and unknown shiners (20%) comprised the majority of fish collected at Gem Island. Alewife (2%) and round goby (0.7%) were only observed in regurgitant samples collected at Gem Island.

23. Please provide more detail on the monitoring that would occur in the Beaver Island area. With the exception of the work being conducted by Michigan State University and the MDNR Charlevoix Fisheries station (which predated CDM), there has been very little monitoring for the desired effects of WS CDM. Central Michigan University (CMU) has been conducting fish population assessments (focusing on smallmouth bass) since 1970. The MDNR Charlevoix Fisheries Research Station has regularly collaborated in this work. This monitoring will continue for the foreseeable future, including; smallmouth bass tagging studies (for estimates of adult abundance), assessments of smallmouth bass growth and condition, measurement of young smallmouth bass production, and evaluation of fish community composition (other than smallmouth bass). Expanded assessment work / monitoring will depend upon availability of additional staff and funding. Our goal is to develop appropriate monitoring programs within available budgets for determining the success of the program. The MDNR is working with the Quantitative Fisheries Center at Michigan State University to help define and refine current data collection procedures to best allocate resources to answer questions regarding the impacts of CDM on fishery resources.

24. The EA relies too heavily on unsupported statements from the Seider (2003) thesis which has not been peer-reviewed or published. The methodologies and data analysis in the study were not sufficient to address the questions posed. There is only a limited amount of information to work with regarding the specific question of cormorant impacts in the Beaver Islands. Seider (2003), Seefelt (2005) and Kaemingk (2008) are the only studies to specifically examine the question. Information from all three studies is included in the EA. To exclude or marginalize any of these analyses would be imprudent. As stated in EA Section 1.5.3.4, Seider (2003) concluded that a mortality problem that was consistent with high predation by DCCOs was likely preventing or slowing the recovery of the smallmouth bass population. The thesis did not assert conclusively that DCCO predation was the only possible cause of the observed trends. The author noted that additional research would be needed for a clear understanding of the role of cormorants in smallmouth bass population dynamics in the Beaver Islands (Seider 2003). The EA does not draw conclusions based on Seider (2003) but does ask questions that adaptive management approaches are intended to help address. (See Response 25, 26).

25. Studies used to justify CDM in the Beaver Archipelago are flawed (study does not include avian data, or address limitations of sampling gear). The Seider (2003) conclusion that mortality due to other predators is unsubstantiated is unsupported because the study did not sample these predators directly or model impacts of these predators. Flaws in Seider (2003) are not given the same scrutiny as work such as that of Seefelt (2005), Seefelt and Gillingham (2008), and Kaemingk (2008) which advocate for a more cautious management approach. Seider (2003) used avian data from other studies that were available to him in his calculations of the potential impact of DCCOs. No other substantive alterations to the fish community or the food web were observed at the time. Seider's conclusions were reasonable enough to raise the question for further consideration. Smallmouth bass samples in each year showed fish in all size categories from 110 mm to 510 mm suggesting that there

were no missing age-classes in the datasets attributable to sampling gear. Kaemingk (2008) concluded, "as evident by very low apparent survival during the summer months, it appears that smallmouth bass are emigrating out of the Beaver Archipelago or suffering from post-spawn mortality". However, Kaemingk (2008) also concluded that, based on the low occurrence of bass in DCCO diets and data on DCCO foraging patterns (Seefelt 2005), DCCOs were not likely to be a limiting factor. Like Seider, Kaemingk (2008) did not directly sample predators or model predator impacts. It is noteworthy that Kaemingk (2008) also concluded that, based on movement between bays and islands, the smallmouth bass population within the archipelago appears to be one large population and that management decisions should incorporate the entire Beaver Archipelago. Limitations of all 3 studies are discussed in Section 1.5.3.4.

The EA works on the basis of science. There are not 'preferred' ideas. The agencies acknowledge that the available information is less than ideal, however we do believe that there is cause for concern regarding DCCO impacts on the smallmouth bass population. The adaptive management approach proposed by the MDNR would allow the MDNR to further explore this issue by manipulating the DCCO population while still ensuring that the action would not jeopardize the DCCO population or have other significant adverse environmental impacts. The proposed action is consistent with USFWS expectations in establishing the PRDO. The USFWS specifically stated that they did not expect agencies to wait until impacts occur and are proven with absolute certainty before they are allowed to manage DCCOs and that one of the benefits of the PRDO is that agencies in areas where the risks of adverse DCCO impacts are greatest are given more flexibility in taking action, including preventive action (EIS Chapter 7, Issue 53).

26. Seider (2003) inappropriately uses a closed population model to estimate bass population. Studies including Kaemingk (2008) and Latta (1963) do not support idea that the smallmouth bass population is a closed population. The population densities calculated using the different methods are similar, indicating movement or mortality is very low (Ricker. 1975), which is likely if the sampling is conducted within a narrow time frame. Most estimates were made from sampling conducted during a 2-3 week period (most often 2 weeks).

27. Fish harvest from the tournament in Ludington area has declined substantially for 5-7 years prior to CDM and that for the last 2 years since the initiation of CDM, the fishery has improved. How can there be any doubt that the DCCOs were limiting the system? We agree that yellow perch numbers have declined within the same time frame as cormorant numbers have increased. However, many factors impact perch populations. In order to separate what is really occurring with fish populations such as yellow perch we propose to use an adaptive management approach to determine whether cormorants are impacting fish populations in this area. Salmon harvest at tournaments has dropped at many locations around Lake Michigan in recent years. This is attributable to a multi- agency agreed upon management action to decrease the number of large predators (salmon) in Lake Michigan (K. Smith, MDNR Fishery Division Chief, internal letter to MDNR December 6, 2006; Newcomb and Dexter 2006) to help maintain a reasonable balance with prey levels.

28. Agencies need to address DCCO impacts on fishery in Saginaw Bay. There are virtually no perch and greatly reduced numbers of walleye in the Bay. The walleye population in Saginaw Bay is currently at fairly high levels though there has been a slight decline recently. There is no evidence that DCCOs are having any current impact on either perch or walleye but we will continue to monitor those populations and the population level of DCCOs. We are aware that there is the potential for cormorants to impact the fish populations in the bay, but we do not currently feel that is the case.

29. The EA inaccurately refers to changes in apparent survival as "pattern of loss". Apparent survival in the Beaver Islands is impacted by mortality and emigration. Data presented by

Kaemingk (2008) angler reports and Central Michigan University's long-term data set support high temporary emigration rates of smallmouth bass. Kaemingk (2008) provides evidence that emigration does occur in the system and can explain at least part of the lower apparent survival. Seider's explanation for this lower apparent survival was that DCCOs may be impacting the population at a low level. The point is taken. However the key observation is that smallmouth bass populations are much reduced compared to populations prior to the increase in DCCOs. In both studies population numbers have been relatively consistent and are clearly much below the abundances of smallmouth bass prior to the occurrence of DCCOs. The emigrations do not explain the major decline in smallmouth bass abundance and are not relevant to explaining the differences in population levels in the 1970s and the current time.

30. The EA inaccurately states that the high recapture rate in netting used for population monitoring in the Beaver Islands is inconsistent with the hypothesis of high temporary emigration rates. Data for population monitoring is only from one sampling period instead of both sampling periods required to adequately address this issue and was used in Kaemingk (2008). While emigration of bass and other fishes away from the Beaver Islands may be a competing hypothesis to cormorant predation it does not account for declines in the fishery. The fishery spans considerable spatial areas as well as seasons and years. It corroborates that bass are scarce. The differing theses underscore the management questions that the proposed adaptive management is intended to address.

31. Seider (2003) concluded that there were particularly high mortality rates in particular age classes. However, fish in those age classes were present during subsequent sampling (Kaemingk 2008). Furthermore, smaller size classes not sampled by Seider (2003) were present in the 2005-2008 Fyke nets instead of the large trap nets. The Kaemingk (2008) study also documented multiple strong age classes over time dominated by fish spawned during the Seider (2003) study. Seider's work and that of Kaemingk span different periods of time and are not necessarily directly comparable. Work on smallmouth bass and cormorant interactions in Lake Ontario has firmly established that cormorants can depress bass populations (Farquhar, et al. 2004). The proposed adaptive management approach is intended to help shed light on the interactions occurring in the Beaver Islands. Both studies here clearly indicated that some recruitment occurred every year – no missing years of recruitment. Kaemingk's study indicated that 2002 and 2005 year classes were stronger than other years, but there are *no* strong year classes in this population.

32. Data in Figure 1-5 refers to population estimates of smallmouth bass in Garden Harbor and not for the entire archipelago. Noted, correction made

33. Smallmouth bass are sampled in trap nets, not gill nets as stated on page 19. Noted, correction made.

34. Given the current level of data collection in the Beaver Islands and other locations where CDM is proposed under the PRDO, it will be impossible to determine if any future population changes are attributable to CDM or other factors in the system. The only way the current data collection would indicate impact of CDM is if there is a massive response in a large number of different fish species as a result of CDM, which is highly unlikely. Agencies need to either do a very thorough program which includes analysis of fish consumption by DCCOs, the changes in fish populations, and the ultimate gains in fishing, or do nothing further. The agencies understand that just as negative changes in fish populations may not be attributable primarily to DCCOs, positive changes may also not be directly attributable to CDM. We recognize the statistical limits (and variation) of our monitoring techniques. It is for this very reason that it is necessary to take the rather large cormorant control numbers that we are seeking. The change in the cormorant numbers needs to be sufficiently large enough to detect

a change in the fish population measures given their variance. We hope to be able to tease apart the various factors that contribute to population levels of smallmouth bass through our evaluations. In light of current challenges with the fisheries in areas discussed in the EA, and evidence to indicate there is reasonable cause to believe DCCOs may have a substantial impact on fishery resources, the MDNR does not feel that taking no action is a responsible strategy at this time. The MDNR is working with the Quantitative Fisheries Center at Michigan State University to identify ways to best address these questions within the limitations of available resources. The proposed adaptive management strategy would allow for management actions with the potential for positive impacts on public resources while still protecting the viability of the state DCCO population and nontarget species (See also Responses 49 and 52).

35. Does the EA provide justification for the Age-0 and Age-1 population objectives in the Beaver Archipelago or proposals to achieve management objectives? To evaluate potential impacts by cormorants on fishes, all ages should be evaluated, if possible. At this time, damage management proposals to address DCCO impacts on these age groups are the same as those proposed for the older age groups.

36. Do data on DCCOs and perch in Green Bay show that DCCOs can adversely impact perch populations? No, models using data from a DCCO food habits study conducted in lower Green Bay indicated that although high DCCO concentrations may have reduced the magnitude of the population increase that could result from strong perch year classes, there was no reason to believe that DCCOs were causing a decline in the perch population (USDA 2009).

37. The EA has inaccurately revised the portrayal of alewife from invasive nuisance species to an important ecological factor as a food source for predatory fish. This argument seems to have been developed to defend CDM when DCCOs were eating alewives in the mid 2000s. It is an example of using data to defend actions contrary to restoring the Great Lakes Ecosystem. While both alewife and round gobies are non-native species, both provide forage for important game species that are highly desired by anglers in Michigan. See EA Section 2.2.7 regarding the role of non-native sport fish in the Great Lakes. We recognize the negative impacts that non-native species can have on other native species and the proposed actions are not intended to preserve goby populations, *per se*. In some of the proposed project areas, management actions are intended to reduce foraging pressure on the overall prey base which, at the moment, also includes round goby and alewife.

38. It is not appropriate to cite the situation with perch in the Les Cheneaux as justification that CDM should be conducted for smallmouth bass in the Beaver Archipelago. Each island off-shore ecosystem is unique. We agree that each island system is unique and we have addressed them separately in the EA. However, the same basic mortality factors are acting on fish populations in each area. The systems may differ in the relative importance of each mortality factor. Work in the Les Cheneaux area establishes that, under certain conditions, DCCOs do seem to have an adverse impact on fishery populations and that CDM may be able to help improve fish populations. Data from other areas in the Great Lakes has also provided information indicating the DCCO predation can adversely impact fish populations. Ridgway and Fielder (In press) note that for predatory fish taken by anglers and DCCOs, a relatively small proportion of DCCO diets may represent a significant portion of juvenile cohorts also targeted by recreational fisheries. Data from Lake Ontario indicated that although smallmouth bass were only approximately 1-7% of DCCO diets, total consumption was sufficient to substantially impact survivorship in sub-adult smallmouth bass (Ridgway and Fielder, In press; Johnson et al. 2002, Lantry et al 2002). The agencies recognize the differences in the systems and are using an adaptive management approach to define management goals and indicators in each area.

39. The EA should consider illegal fishing as a potential cause of observed problems with the smallmouth bass fishery in the Beavers. The archipelago is isolated, infrequently patrolled and easy to fish without law enforcement repercussions. The MDNR considers all factors which could contribute to the decline in smallmouth bass numbers, including illegal harvest. Quantifying illegal take is always difficult, however, available information indicates that illegal harvest is not likely to be the limiting factor for the smallmouth bass population in the Beaver Islands. People generally take the older (adult) age classes of fish. However, data from Seider (2003) indicate that survival rates for adult bass are relatively high which would indicate that angler harvest (legal and illegal) is not limiting the population. Similarly, data from Kaemingk (2008) also indicated that adult smallmouth bass are not experiencing high mortality during the summer months when illegal harvest may be more likely.

40. The importance of DCCOs to the overall fishery in the Great Lakes is overstated. DCCOs are only a small part of a complex food web. The tropic structure of the Great Lakes is resilient enough to absorb the predation pressure of a single native species. We understand the complexity of the Great Lakes ecosystems and understand that DCCOs are only a part of the food web (Ridgway and Fielder, In press). However, the trophic structure of the Great Lakes has repeatedly demonstrated its susceptibility to the impact of single species of predators or competitors (sea lamprey, alewife, rainbow smelt, zebra mussel, quagga mussel, bythotrephes; Bence and Mohr 2008, Clapp and Horns 2008). At no time have the agencies asserted that DCCOs are the only factor impacting the fishery. However, the analysis in the EA indicates that there is reasonable evidence to conclude that DCCOs are a significant component in the factors negatively impacting some fisheries and that CDM may be beneficial.

41. Cannot justify killing off the DCCO population in the state because a small number of birds eat fish at aquaculture facilities or because of the rare incidences of damage to property. The EA analyzes all types of CDM which may be conducted in the state to facilitate understanding of the cumulative impacts of CDM actions on DCCOs and other issues. Local population reduction is not proposed as a solution for depredation problems at aquaculture facilities or property damage. Problems at these sites are managed on a case by case basis and limited removal of individuals would only be authorized if practical and effective nonlethal methods are not available. These limited removals would not be expected to substantively impact the state DCCO population.

42. Data in Appendix F for Thunder Bay show that very few bass of any size are found in DCCO diets (0.04%) and only 1.22% of their diet was yellow perch. These levels of consumption are not enough to adversely impact populations of these species. Cormorant damage management has not been proposed in Thunder Bay solely for the purpose of protecting yellow perch. Section 1.5.3.2 of the EA establishes lake whitefish, brown trout, overall fish biomass and sport fish populations as the issues of concern for this area. The impact of removing what seems like a relatively small number of fish on a fish population will depend on a number of factors including population size, productivity and the point in the life history of the fish where the predation occurs. At times, when frequency of a species in DCCO diets is low, impact may be a function of overall DCCO population size. Even a low rate of fish consumption per cormorant can add up to substantial impacts on a fish population if there are several hundred to thousands of breeding DCCOs consuming fish. Ridgway and Fielder (In press) also noted that for predatory fish which are also targeted by anglers, such as smallmouth bass, a relatively small proportion of DCCO diets may represent a significant component of the juvenile cohort of fish.

43. DCCOs are not an issue for small privately owned ponds because DCCOs are only found on the coast of the Great Lakes where they can find the small islands they need to safely reproduce. DCCOs are not restricted to the Great Lakes or to nesting on islands, although island sites do seem to be preferred. Additionally, problems with DCCO foraging are not limited to breeding birds. Large numbers of DCCOs migrate through the state, and these migrants can also be involved in depredation problems.

The EA specifically discusses DCCO conflicts and management actions conducted at inland lakes (Section 1.5.3.10, See also Response 41 regarding conflicts at aquaculture facilities). Sault Tribe walleye rearing ponds located 10-15 miles from Lake Huron and the St. Marys River are regularly visited by flocks of cormorants that consume sizable number of the small walleye (M. Ebener, CORA, Sault Ste. Marie, MI, pers. comm.).

44. Cormorant damage management proposed for the Beaver archipelago is excessive. Current efforts have not been implemented long enough to determine if they are having an impact. Agencies should just monitor impact of current program. The agencies have reviewed comments and available data on the Beaver archipelago. The agencies still believe that there is reasonable cause to believe that DCCOs may be adversely impacting the fishery in the area but also acknowledge that the data is not unequivocal (Responses 21, 24-26). Consequently, the management objectives for the Beaver Archipelago have been modified from a proposal to reduce the population 50% each year (Section 1.5.8.2) to a proposal to reduce the population 50% per year to 3,000 breeding pair for the archipelago and monitor the response of the fishery to this reduction. This is an approximately 74% reduction from the 11,549 breeding pairs observed in 2007, and is likely to be of sufficient magnitude that an impact from the reduction in DCCO predation may be observed despite the numerous variables in the system. Observing the fishery response to a DCCO population maintained at a relatively constant level instead of a steadily decreasing DCCO population will also help to reduce the variability in the data analysis.

45. EA needs to consider possibility that scarring of whitefish may be caused by other piscivorous birds such as eagles and mergansers which are also numerous in the area. Cormorant marked whitefish began showing up in northern Lake Michigan just about the time that cormorant abundance peaked in the early 2000s. Reports of scarred whitefish were rare or nonexistent until this point in time even though there have been eagles, mergansers, and loons in the upper Great Lakes for decades. Eagles and mergansers do not dive 90 to 100 ft. and swim into trap nets to capture whitefish like cormorants do. Loons do, but they can't escape the nets like cormorants do. Increased problems with loons would be reflected in increased risk of loons captured in nets.

46. EA needs to consider possibility that increasing populations of other piscivorous birds including gulls, mergansers and eagles are causing declines in the Beaver Archipelago. Great Lakes Colonial Waterbird Survey data (Linda Wires, University of Minnesota, unpub. data; Cuthbert et al. 2002) indicate that the number of nesting Ring-billed Gulls in the Michigan portions of Lake Michigan increased from 32,256 breeding pairs in 1977 to 80,766 pairs in 1989-1991 and then decreased to 46,542 pairs in 1997-1999. Herring Gull populations followed a similar trend going from 7,307 breeding pairs to 11,691 pairs and 7,766 pairs during the same intervals. In the Beaver Islands, the Ring-billed Gull population increased from 7,292 pairs in 1976 to 24,289 pairs in 1989-1990, and then decreased to 3,001 pairs in 2007-2009 (MDNR unpublished data; L. Wires, University of Minnesota, unpub. data; Cuthbert et al. 2002). The number of Herring Gulls went from 2,592 pairs in 1976 to 3,534 pairs in 1989-1990 and then decreased to 2,969 pairs in 2007-2009. Gull populations appeared to be decreasing during the period when the DCCO population was increasing and smallmouth bass problems were documented. Mergansers are not counted during the Colonial Waterbird Survey. The data available for mergansers suggest that while the populations have oscillated over the years, and that the current population levels are very similar to thirty years ago (MDNR unpublished data).

47. In order for there to be a cause and effect relationship between DCCOs and perch there should be a lag between increases in cormorant populations and perch decline. Instead, Figure 1-6 of the EA shows competitive exclusion of yellow perch by alewife. The correlation between cormorant increase and perch decline is potentially spurious and should be omitted. This is an inaccurate interpretation of the material presented. If alewife were competitively excluding perch then we would

expect an increase in alewife concurrent with a decrease in perch. The graph demonstrates that both species are declining over the entire time period. We recognize that there are certainly other biotic and environmental factors that impact yellow perch and alewife abundance but suggest that cormorants may be a contributing factor.

48. Fishermen only want large smallmouth bass (spawning size). Spawning size bass are too big for DCCO to consume so why are we worried about DCCO impacts on bass? The concern regarding smallmouth bass is that DCCO predation, in addition to other mortality factors, is reducing the number of smallmouth bass that survive to become large enough to spawn or be of interest to anglers.

49. The measurable goals and data collection are not specific enough to adequately assess the impacts of the program on the sport fishery and commercial harvest. Section 1.5.8 provides the management objectives for each of the primary areas where CDM is proposed. We believe the objectives and data collection systems described in the EA are adequate, but we do recognize that they are not ideal. However state and federal funding is very limited at this time. The MDNR is working with the Quantitative Fisheries Center at Michigan State University to help define and refine current data collection procedures to best allocate resources to answer questions regarding the impacts of CDM on fishery resources. In establishing the PRDO the USFWS specifically noted that they did not expect agencies to have perfect information.

50. DCCOs are now primarily eating round goby which has less nutritional value than alewife (N. Seefelt, unpub. data). Young fed a diet primarily of round gobies will not develop as fast as chicks fed alewife and adults will be unable to feed as many offspring as they did prior to the influx of gobies. Therefore, DCCO population in the Beaver Islands which is already declining because of actions of WS will most likely continue to decline with no further action by WS. We agree that the number of nesting DCCOs in the Beaver Islands area has been generally decreasing (EA Table 1-1). It is too early to determine the impact of round gobies on DCCO survivorship or productivity. Although gobies are of lower nutritional value, available data indicate they are very abundant in some areas. DCCO populations increased during periods of alewife abundance and, even though round gobies have a lower nutritional value, there are insufficient data to indicate that the DCCO population, in the absence of CDM, would necessarily decline on a diet primarily of gobies. Lower rates of increase or a stable population are also possible options. The adaptive management program and annual monitoring of nesting DCCOs at sites where CDM is proposed would enable agencies to adjust CDM to allow for any changes in the DCCO population which may be associated with addition of round gobies to DCCO diets. Additionally, DCCOs are opportunistic when feeding and will take larger prey than gobies if they are available. The fact that DCCOs are eating a lower value food source doesn't guarantee a decrease in population. Alternatives could include a population increase at rates lower than those observed when DCCOs were feeding on alewife.

51. Has the concept of sustainability in the EA been limited to only fish harvest? No. The EA considers the impact of the proposed action on the sustainability of the DCCO population and on nontarget species populations. The proposed action includes several measures intended to maintain the population viability and distribution of DCCOs in Michigan (Section 1.5.8.1).

52. If the EA adequately implemented adaptive management, it would include clear resource objectives, analyze alternative causes for fishery declines and monitor effectiveness with adequate tools, and include diet analyses. Objectives for primary areas where CDM is proposed are stated in Section 1.5.8.2. Funding availability is very limited at this time. We recognized that the goals and assessment provided in the EA may be challenging to document the effects of the control program. The DNRE is working with Michigan State University to review and modify our assessment monitoring

methods as well as our overall target control levels to conform to the concept of Adaptive Management. The agencies also recognize that diet information would be valuable but even diet data are of limited utility unless there are adequate data on the standing fish biomass and fish production in the impacted area. The MDNR is particularly concerned about the level of fish production that is being consumed by cormorants. Cormorants are either consuming games species directly or consuming forage fish that game species feed on. Either way would influence game species production. This proposed action is not intended to perpetuate indefinitely if it is not successful. After a 5 to 10 year period, some of the control will likely be discontinued if fish communities are not benefitting from the control efforts. See also responses 18, 23, 34, 39 and 49.

53. Calculations of consumption indicate consumption is near or in excess of biomass but in reality, round goby have increased and other fish populations have remained relatively constant. The calculations are a generalized estimate which needs to be validated by research, and a number of assumptions must be made to use the estimates. However, the calculations do provide an indication that the level of DCCO foraging in Bays de Noc and Thunder Bay is placing a considerable demand on fishery resources. The agencies do not believe it is accurate to portray the situation in all areas as having increased or stable total fish biomass. In Thunder Bay, total trawl catch rates declined substantially starting in approximately 2000 (Fig. 1-4) and have remained at reduced levels even though the amount of round gobies in the catch has increased in recent years. Alternatively, DCCO foraging impacts are localized and are generally greatest in a radius around nesting colonies as has also been documented for other colonial waterbirds (e.g., Ashmoles halo; Ridgway and Fielder, In press). Influx of fish from the larger system may allow the bays to support larger DCCO populations than could be sustained if the bays were an isolated system.

54. EA fails to provide information on the disagreement between Diana (2010) and Fielder (2010*b*) regarding the impacts of DCCOs and CDM on the perch fishery in Les Cheneaux. Comments by Diana show flaws in work by Fielder. The agencies have reviewed the comments from Diana and responses by Fielder in the published literature (Diana 2010, Fielder 2010*b*). While we agree that the data and conclusions presented in Fielder (2008), have limitations, after reviewing Diana (2010) and Fielder (2010*b*) we do not feel that these limitations compromise the utility of the work. Additionally, the EA also uses a more current publication (Fielder 2010*a*) which includes data on the yellow perch fishery in the Les Cheneaux before and after CDM. The additional data available after the initiation of CDM addresses some of the concerns raised in Diana (2010). Limitations to Fielder (2010*a*) are discussed in EA Section 1.5.3.1. See also Responses 34, 49 and 52.

55. Changes in fish harvest shown in Figure 1-2 are nominal relative to the reduction in DCCO foraging pressure. Changes could just as readily resulted from changes in alewife, increase in round gobies, or substantial drop in Chinook salmon. The agencies acknowledge that DCCOs are not the only factor impacting Great Lakes fish populations (Fielder 2010a, b). However, the agencies do believe that the pattern in the perch population before and after CDM and analysis of many of the factors which might influence the perch population do indicate that DCCO foraging has had a substantive impact on perch populations in the Les Cheneaux. The MDNR has not observed the favorable population responses in other yellow perch communities such as Saginaw Bay where similar changes in alewife, goby and salmon populations have also occurred.

56. If CDM has helped to recover the yellow perch population in the Les Cheneaux, has it been cost effective? Wildlife Services has been conducting most of the CDM under the PRDO in Michigan, spending approximately $125,000 per year on average as appropriated by Congress; additionally, the State of Michigan provided WS $150,000 in 2007 which was spent on CDM over three years. Only a portion of the Congressional funds have been spent on the Les Cheneaux Islands. By comparison, the

annual economic loss due to the diminishment of the yellow perch fishery in that community is estimated at over $ 5 million dollars (Fielder 2010*a*).

57. Data on CPUE in gillnets in Fig. 1-2 show an increase in CPUE between 2004 and 2006, but by 2008, CPUE decreased to levels seen in 2004. The data indicate that changes in CPUE occurred before the major change in DCCO numbers and that most likely some other factor is driving the system. We do not agree. Angler harvest rates and angler harvest rate per unit effort continue to be above 2004 levels as is catch rate in Hessel Bay. Overall CPUE went back up and 2010 is the second highest level of the survey series since 1985 (D. Fielder, MDNR, unpub. data). Improvements in the fishery appear to be concurrent with marked decreases in the number of nesting DCCOs. A substantial (30%) drop in DCCO breeding pairs occurred the first year after initiation of CDM in the Les Cheneaux Islands, and the number of breeding pairs had dropped 66% by 2006 (Fig 1-1). Additionally, the decrease in breeding pairs does not include the decrease in foraging demand which resulted because of the reduction in reproduction associated with egg oiling.

58. There should not be a substantial increase in the number of birds to be killed at LCI because data from LCI is not conclusive regarding the impacts of DCCOs and CDM on the perch population. The proposal for the LCI is to maintain the number of breeding pairs in the LCI at approximately 500 pairs for 5 years and continue to monitor the response of the fishery to the reduced DCCO population. This is the management proposal implemented in the area since 2008 and is not a substantial increase in DCCO take.

59. There are no peer-reviewed studies or any other data to justify CDM in Bays de Noc. Comparison to North Channel is inappropriate because they are two extremely different environments. We agree that it is difficult to extrapolate information from one control location and apply it to other locations where species composition and population dynamics may be significantly different. It is for this very reason that we are attempting to explore the effects of cormorant control at multiple locations throughout Michigan. Through adaptive management, control measures will be modified for the unique conditions at each site. While we do not have sufficient information to calculate relative productivity in northern Lake Michigan, we do think that the North Channel of Lake Huron is sufficiently similar to make some casual production estimates.

60. There is no data to justify CDM at Ludington, Bellow, Paquin, Naubinway, Tahquamenon Islands or the St. Mary's River. Information relevant to the need for action in these areas is presented in Sections 1.5.3.5 through 1.5.3.9. In 2004, stomach contents were examined from 40 DCCOs taken from lower Whitefish Bay and Upper St. Mary's River. Of the 16 birds with food in the stomach, 3 contained walleye (4 fish) and two contained yellow perch (5 fish). Although this was a small sample size, walleye and yellow perch constituted 7 and 9% respectively of the total number of food items found in the DCCO stomachs. The walleye and yellow perch accounted for 40% and 38% by weight of the food items found in the stomach contents. Regurgitant samples collected at Gem Islands in the St. Mary's River also indicate consumption of yellow perch. There has also been degradation of the approximately 90% of the tree canopy on Gem Island in the St. Mary's River (Figures 6-1). Commercial fishermen have been reporting cormorant-scarred whitefish in nets in northern Lake Michigan near Naubinway and Paquin Islands (M. Ebener, CORA, Sault Ste. Marie, MI, pers. comm.). The agencies and tribes believe this data is sufficient to warrant the CDM proposed for these sites. See also Response 13 regarding the availability of data and CDM and Response 22 regarding diet studies conducted in the St. Mary's River.

Figure 6-1. Gem Island, St. Mary's River, 2006.

61. Only two smallmouth bass were observed in stomach samples collected in the Beaver Islands. If the fish population cannot withstand this level of natural predation then there are larger problems that should be addressed. Diet data in question were collected after the decline in the smallmouth bass population had occurred. Given that DCCOs are opportunistic foragers, it is not surprising that only limited bass were found at the time of the study. The relative lack of smallmouth bass in DCCO diets after the majority of the decline only indicates that the reduced bass population is not a large portion of DCCO diets. It does not address the issue of whether or not DCCO foraging could have impacted the population in the past. Although smallmouth bass may only comprise a very limited portion of DCCO diets, impact on the fishery is also a function of population size. There are a large number of DCCOs foraging in the Beaver Islands (approximately 7,520 breeding pairs in 2009).

62. It is wrong to stock non-native fish, control native predators and allocate all fish resources for human use. The appropriateness of managing DCCOs for the protection of sport fish is a value judgment that will vary depending on the values and perspectives of the individuals involved. Many of the predatory fish populations in the Great Lakes are non-native species that were introduced to control over-abundant alewives whose populations exploded after the native lake trout was eliminated from most of the Great Lakes by overfishing and sea lamprey predation. Salmonid management is also identified by Fish Community Objectives for each of the Great Lakes, which are supported by all the management agencies surrounding the Great Lakes. See also Response 14 regarding tolerance for DCCOs and DCCO use of fishery resources.

63. Studies from Michigan and elsewhere continue to show that that DCCO diets contain 90% or more of non-native prey fish, primarily round goby and, historically, alewife. The level of predation on native fish is not sufficient to adversely impact native fish populations. It is an over-simplification to say that DCCO diets in all locations are primarily comprised of round goby or other invasive fish. Diets vary considerably among locations and time of year depending upon the availability of different fish species (e.g., some fish species come into shallow water to spawn in spring). For example, very few round gobies or alewife were found in regurgitant samples collected at Rock and Gem Islands in the St. Mary's River in 2007 and 2008 (See Response 22). The high consumption of round gobies is only occurring in some locations where cormorant control is being proposed. We believe that significant consumption of game fish and important forage fish is still continuing at most locations. Additionally, when DCCO numbers are high, even a low proportion of game fish in DCCO diets can lead

to a relatively high level of fish consumption, because of the number of birds taking fish. Impacts on fish populations also depend on the initial productivity and relative abundance of the species in question. Depending upon the species under consideration, the same rate of foraging pressure may have a greater impact on species stocked or present in relatively limited numbers than on a naturally producing fish population.

64. If CDM increases, won't birds abandon sites and seek new locations? This could spread the damage problem. Would ground-nesting birds start nesting in trees (to get away from oiling) and causing more ecological damage than they were when nesting on the ground? Available information on DCCO movement from one colony to another in response to CDM is provided in Section 4.1.2. There is some risk that birds will seek new sites. However, not all colonies automatically cause damage to the site where they are located and it is possible that multiple smaller colonies spread across the landscape may cause fewer conflicts than a limited number of large colonies. The agencies will continue to monitor for the presence of nesting DCCOs at new sites as part of the CDM program. Additionally, as local cormorant breeding populations are reduced and management goals are met, additional emphasis is placed on ancillary effects of management activities while developing management recommendations. These include the effects of disruption to co-nesting species during egg oiling and culling, and changes in cormorant behavior due to culling pressure or disturbance during egg oiling. In the short term, overall reductions in cormorant numbers and associated acidification and nutrification are likely to provide a sufficient benefit to offset damage done by birds shifting from ground nesting to tree nesting.

65. Agencies should not leave bird carcasses out to rot. The MBTA and PRDO require proper disposal of birds killed for damage management, including donation for scientific or educational use, incineration or burial. Agencies conducting CDM make all reasonable effort to comply with these requirements, however, some birds cannot be recovered, usually because the site is inaccessible (e.g., high in a tree).

66. The 3 paragraphs on aesthetic values in Section 2.1.4 are not adequate treatment of the issue. Aesthetic values are addressed in detail for each alternative in Chapter 4.

67. Issues of vegetation damage, DCCO colony encroachment on T&E species, damage to property, threats to aircraft seem unlikely in the Beaver Islands. Most of the vegetation on the islands where DCCOs nest is invasive species. The DCCO colonies in the Beaver archipelago are on islands which are closed to public access and so any complaints about aesthetic impacts are not justification for CDM. The EA provides a cumulative analysis of all types of cormorant damage management that may be conducted in Michigan. Not all types of conflicts may be applicable to every situation. As noted in Section 1.5.8.2, the management objective for the Beaver Island Archipelago is to restore the smallmouth bass population and fishery and reduce overall foraging demand on the prey base of Lake Michigan.

68. Vegetation on Pismire and Gull Islands is recovering and is proof that CDM is not needed to protect vegetation at these sites. Nutrients from DCCO guano is enabling more plants to grow and plant species richness is greater that before DCCOs although vegetation communities will not be the same as before DCCOs. These observations confirm that efforts to reduce cormorant nesting on an island may be highly beneficial to restoring plant communities where existing vegetation had been destroyed by nesting cormorants. They are also consistent with preliminary research findings from areas where high concentrations of DCCOs have resulted in vegetation loss which indicate that seed banks survive for several years after vegetation has died. The determination of whether additional cormorant management is needed on these islands will depend on the desired condition of the avian and plant communities on the islands as well as whether or not cormorants reinitiate nesting on the islands. It is expected that any management of this long lived, gregarious species will need to be long-term in scope,

involve ongoing monitoring and assessments, and be responsive to changing conditions both in the environment and the population dynamics of the species.

69. DCCOs have nested in colonies with other birds throughout the Great Lakes Region and other areas for hundreds of years. No evidence has been produced to demonstrate that DCCOs on the Great Lakes are having significant enough impacts on co-nesting colonial waterbirds to warrant CDM or to demonstrate that reducing DCCO numbers will increase numbers of other species. Reasons for managing DCCOs at individual breeding colonies vary from location to location. While no colonies are being managed at this time to reduce impacts to co-nesting waterbird species, adverse impacts on co-nesting species which need trees or shrubs for nesting habitat has been an issue in other states. For example, the Black-crowned Night-Heron is listed by the Michigan Natural Features Inventory as a Special Concern species in Michigan; where dangers to the continued existence of any established Black-crowned Night-Heron colony are identified, reductions in nesting cormorants may be considered to protect night-heron nesting habitat. Addressing this type of damage in the EA facilitates federal agency response to this type of damage if there is reason to believe it is occurring in Michigan. Information on situations where DCCOs have been documented to have adverse impacts on co-nesting species or their habitat is provided in Section 1.5.4.

70. If the agencies are concerned about co-nesting colonial waterbirds they should refrain from entering colonies with these birds present, develop a monitoring program for species of concern, and preserve high quality habitat. Concern for co-nesting species factors into the annual development of agency management recommendations and the selection of management practices at specific breeding colonies. Procedures for reducing impacts on co-nesting species are also provided in the Standard Operating Procedures listed in Chapter 3 of the EA. At sites where there are concerns for the impacts of access by individuals to oil eggs or cull adults, portions of islands have been avoided to minimize impacts, or the number of site visits has been reduced to minimize impacts. Statewide monitoring and habitat management of species other than cormorants is outside the scope of this EA and is addressed by other conservation programs at the state and federal level.

71. Why are the agencies proposing to control DCCO population to reduce aircraft hazards when there have been no documented collisions between DCCOs and aircraft in MI or the Great Lakes? There cannot be any hazards to aircraft on the Beaver Islands because DCCOs don't fly inland. The assertion that DCCOs do not fly inland is not correct. DCCOs migrate overland from the Great Lakes to the Southern U.S. each year and DCCO foraging on fish has been documented at inland lakes in Michigan. The multiple inland DCCO colonies in Minnesota are also testimony to DCCO use of inland habitat (USDA 2005). The EA analyzes all types of CDM which may be conducted in the state to facilitate understanding of the cumulative impacts of CDM. Local population reduction is not proposed to reduce risks to aircraft from DCCOs. Problems at these sites are managed on a case by case basis and limited removal of individuals would only be authorized if practical and effective nonlethal methods are not available. These limited removals would not be expected to substantively impact the state DCCO population. In the EA, we note that risks to aircraft safety from DCCOs in Michigan are low. However, it is not correct to state that there have been no strikes in Great Lakes States. In addition to the examples of DCCO strikes and damage to aircraft in Minnesota and Illinois noted in Section 1.5.6, for the period of 2000-2010, there has also been an additional DCCO strike in Illinois, 2 additional strikes in Minnesota and one strike in Wisconsin. Strike rates are likely an underestimate of risk because many airports have wildlife hazard management programs in place specifically to reduce strikes from birds like DCCOs. As noted in the EA, over the period of 2006-2008, 33 DCCOs were killed to reduce hazards to aircraft and additional birds were hazed from airport property using nonlethal methods. For more information on wildlife hazard management at airports we recommend the following web site: http://wildlife-mitigation.tc.faa.gov/wildlife/.

72. Is fecal contamination from the DCCO colony at Ludington, MI responsible for the nearby closure of beaches because of Coliform bacteria? The agencies consulted with M. Hill from the Michigan Department of Health District 10 regarding the spikes in bacteria and data presented by commenters. Large concentrations of birds (cormorants, gulls, geese) can impact E. coli levels, but the DCCOs in the Ludington colony may not be the source of the changes in the E. coli levels presented by commenter. A sewage spill in Ludington may have contributed to some of the spikes reported. Another site with elevated E. coli levels reported by commenter had a defective sewage pipeline nearby which could also have impacted E. coli levels. Heavy storms may also wash contaminants into the water. Specific testing would be required to determine the source of the E. coli before a conclusive determination could be made.

73. Why does the EA discuss DCCO impacts on water quality when there is no substantiated evidence of DCCOs having such impacts? From the Final EIS on Double-crested Cormorant Management in the United States (USFWS 2003) to which this document is tiered, "...it is true that there is currently no evidence that they are responsible for widespread contamination or are a significant threat to human health. But, since impacts to water quality were a significant concern raised during scoping, we felt that it was appropriate to include the issue in the DEIS [Draft Environmental Impact Statement] analysis." Although there are not currently any situations where there is evidence of DCCOs having an adverse impact on water quality in Michigan, the issue of DCCO impacts on water quality was also raised in comments on this EA.

74. Are current concentrations of DCCOs unnatural? Double-crested cormorants have a well documented presence in the United States and are a native species. In ornithological checklists for Michigan dating back to the 1800s, cormorants are noted as present in the state. High numbers were seldom observed, but breeding sites on Great Lakes islands were likely seldom visited and poorly surveyed, if at all, at this time. There is no reason to believe that cormorants are not native to the Great Lakes though the current population is probably higher than the presettlement level (Weseloh et al. 1995).

75. EA provides no data on actual opinions of the general public, nor are there any plans to obtain such data. Public opinions of a vocal minority are used to represent the public in general. The MDNR and USFWS regularly communicate with stakeholders regarding cormorant management both through participation in organized meetings and as a result of unsolicited comments from members of the public. This input from private citizens as well as their elected representatives at the local, county, state, and federal level regarding the values they place on cormorants, their prey, and their environment is used when assessing the desires of the residents of Michigan.

76. EA wrongly persecutes groups which provide sanctuaries for DCCOs and disregards their wishes to provide sites free of DCCO control by conducting CDM as close as 500 yards from the sanctuaries. The EA does not persecute any landowner. Analyses of impacts of the proposed action note that DCCOs may move from areas subject to CDM to areas which are not subject to CDM and that restricted access to some colonies may limit the ability of the MDNR to achieve DCCO management objectives in some areas. The authority of any landowner in the state of Michigan does not extend beyond the boundary of their property. In the case of Great Lakes island landowners, this authority does not extend over the open waters of the Great Lakes. The Great Lakes bottomlands in Michigan are owned by the State of Michigan and administered by the MDNR. As such, the MDNR is the land manager for the open waters of the Great Lakes around privately owned islands and has the authority to manage resources in these areas as necessary. As a compromise, when requested by the landowner, WS does not shoot of adult birds within 500 yards of these islands to minimize noise disturbance to nesting birds.

77. What impact do public comments have on agency decisions? Public comments are a valuable means of ensuring that all relevant issues, data and alternatives are addressed in this chapter of the EA. Agencies consider these issues in detail before making management decisions. Modifications to the proposed action have been made based on public comment and are described in the Decision and Finding of No Significant Impact.

78. EA's statement that DCCO populations in the Great Lakes have been increasing is inaccurate and has been inaccurate for the last 10 years. This statement was erroneously made in Section 1.4. and has been corrected. Correct information on the State DCCO population trends and regional trends is provided in Section 1.5.1 and in the population impact analyses in Chapter 4. In addition to the material presented in the EA, the 2009 Great Lakes Colonial Waterbird survey indicated there were approximately 18,220 breeding DCCO pairs in Michigan, down from 29,383 nests counted in 2007 (Cuthbert 2009). There were also decreases in many colonies where CDM was conducted in 2010 (WS, unpublished data). Language in Section 1.4 has been corrected to read, " Increases in the North American DCCO population and associated concerns of the negative impacts associated with the DCCO population expansion led the USFWS to establish the PRDO and expand the AQDO (USFWS 2003). Although cormorant populations have decreased in many areas where the PRDO and AQDO have been implemented, the need to protect aquaculture, property, natural resources, and human health and safety from damage and conflicts associated with DCCOs described in the USFWS FEIS remain (USFWS 2003). The need for action described in the FEIS is summarized in the following subsections..."

79. Isn't the goal of maintaining the Michigan cormorant population at approximately 5,000 breeding pairs futile because birds from other areas will fill in the spaces? The objective of the proposed action is to manage cormorant damage in Michigan, not to reduce the population to 5,000 breeding pairs. The EA established a minimum state population of 5,000 pairs and the goal of maintaining DCCO distribution throughout its current range in the state to protect the viability of the state DCCO population (Section 1.5.8.1). Damage management actions will be monitored and adjusted to ensure that they do not reduce the state DCCO population below 5,000 breeding pairs. Evidence from the program in the Les Cheneaux Islands area indicates that, depending upon the management objectives for the site, some sort of long-term management may be needed to achieve management goals. However, over time, the number of birds taken per year decreases and in some areas, it may be possible to maintain populations at or near management objectives primarily with methods such as egg oiling.

80. Commenter states that personal conversations with authorized agents of WS indicate agents are not acting responsibly and are only participating so they can shoot DCCOs. All volunteers working as agents of WS are required to take an annual training course before they can participate in the program. Only a few agents at each site are authorized to take DCCOS. Most individuals working as agents of WS are only authorized to use harassment. The course includes information on the historical and legal status of DCCOs in Michigan as well as the requirements for safe, legal and effective implementation of the harassment program. Agents violating the terms and conditions of the harassment program are removed from the project.

81. There is no reason to believe that there would be a risk to public safety if disgruntled individuals took matters into their own hands. Unauthorized take of DCCOs is a violation of the MBTA, state wildlife laws and the provisions of the PRDO. Safe use of firearms, pyrotechnics and other equipment used for CDM requires training for safe and effective implementation. Wildlife Services, MDNR and tribal staff who conduct CDM are specifically trained in the safe and effective use of CDM methods. Volunteers who use pyrotechnics and firearms as designated agents of WS also receive safety training. Without this kind of training, there is increased risk to public safety and to the safety of the individuals implementing the CDM.

82. EA cannot conclude that there will be no significant impact on the human environment. We recognize that the proposed removal of DCCOs will result in a substantial reduction in the DCCO population in Michigan. However, this reduction was analyzed and authorized in the USFWS FEIS on DCCO management in North America. Analysis in the EA indicates that there will be no other substantial impacts on the human environment from the proposed action.

APPENDIX B
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